Aerospace Command and Control & Intelligence, Reconnaissance and Surveillance Center

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Aerospace C2 & ISR Center
Technical Director

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Purpose

Provide an overview of the AC2ISRC and top projects

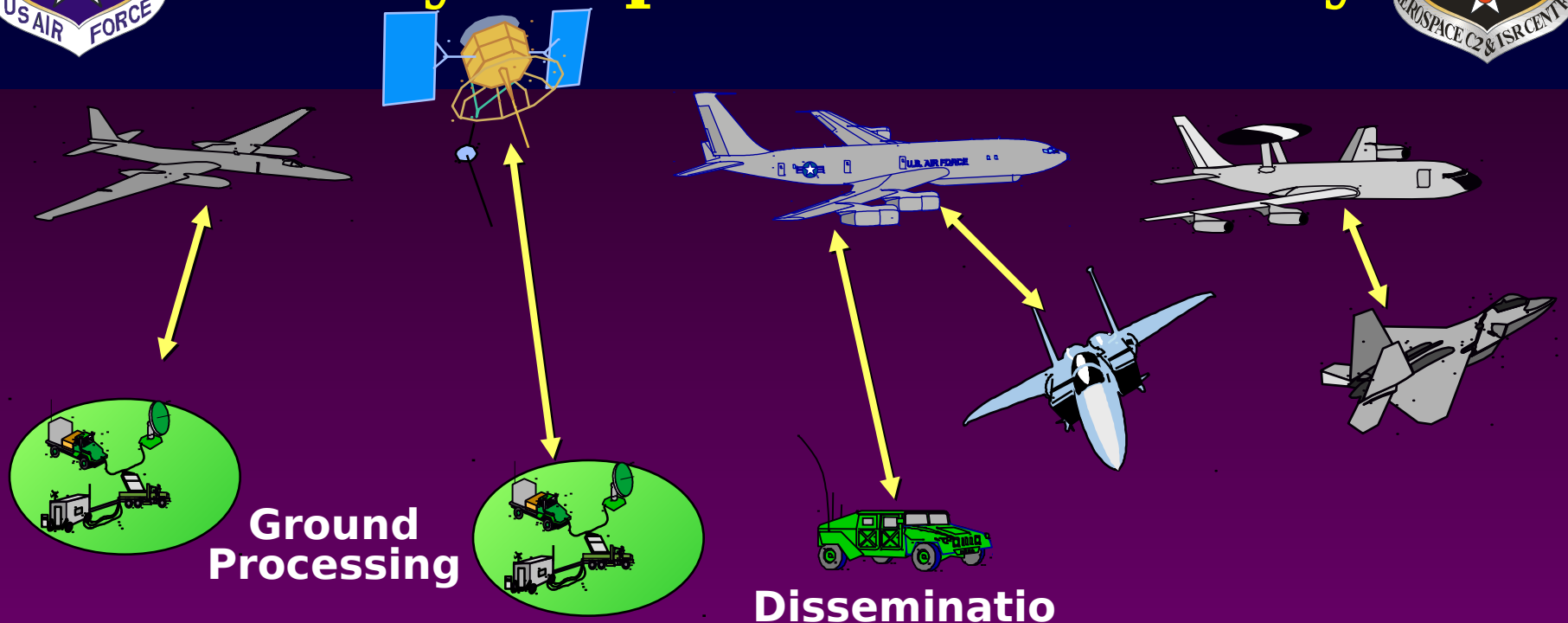
Overview

- Mission and Organization
- Priorities
- Challenges

Overview

- **Mission and Organization**
- **Priorities**
- **Challenges**

Today's Operational Reality

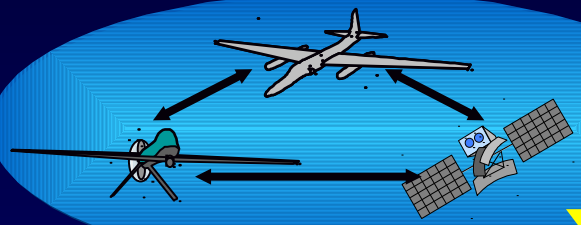


- Individual stove-pipe systems
- Lack of bandwidth
- Labor intensive collection / coord
- Difficult to build recognized operational picture
- Little interoperability
- Large forward footprint
- Non-standard C2 centers
- Scattered snapshots of the battlespace

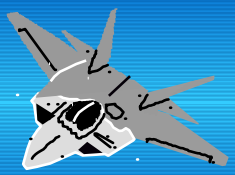
"Data Overloaded, Information Starved" -- SAB

Future C2ISR Operations

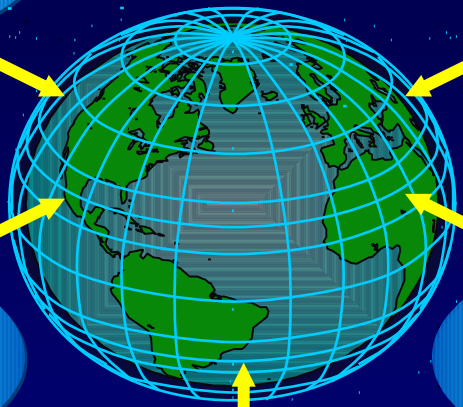
Sensors

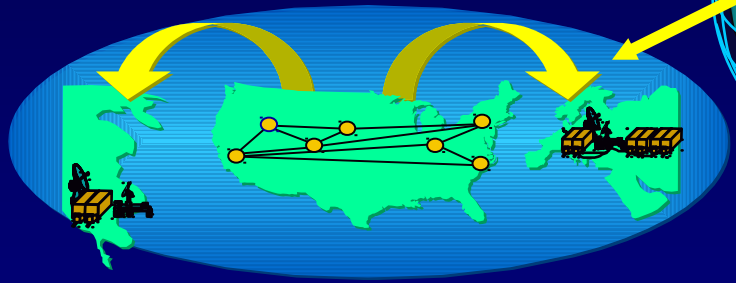


Weapon Systems

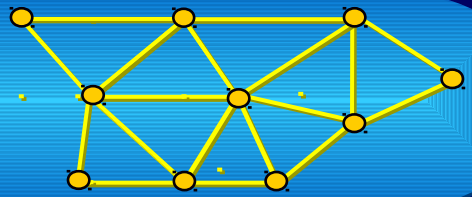


Global Grid

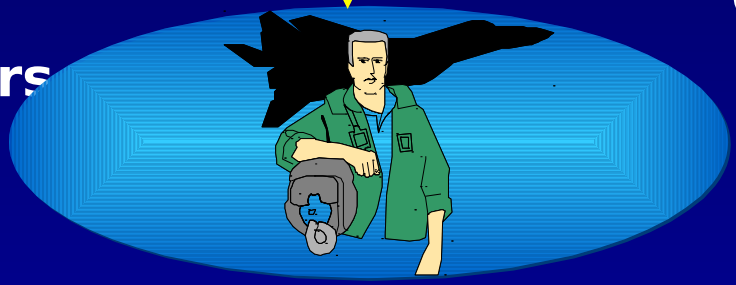




Processing & Exploitation Centers



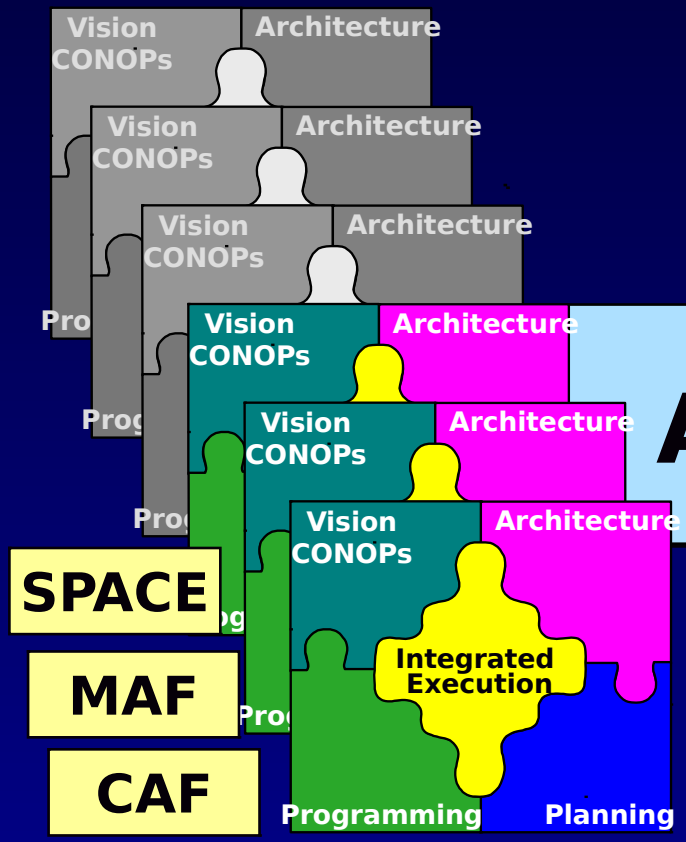
C2 Centers



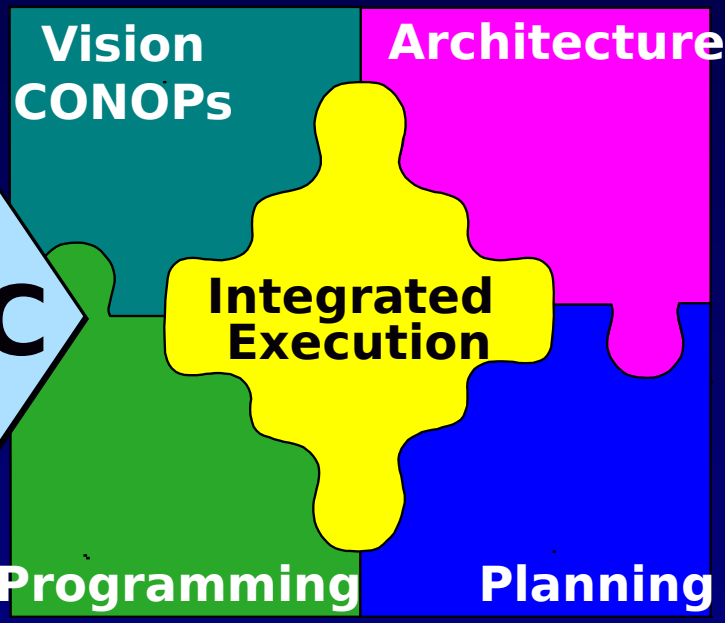
Aerospace Warriors

Integrated C2 Requirement

Today



Future



AC2ISRC

Independent Enterprises

Cohesive Enterprise-Wide View

Mission

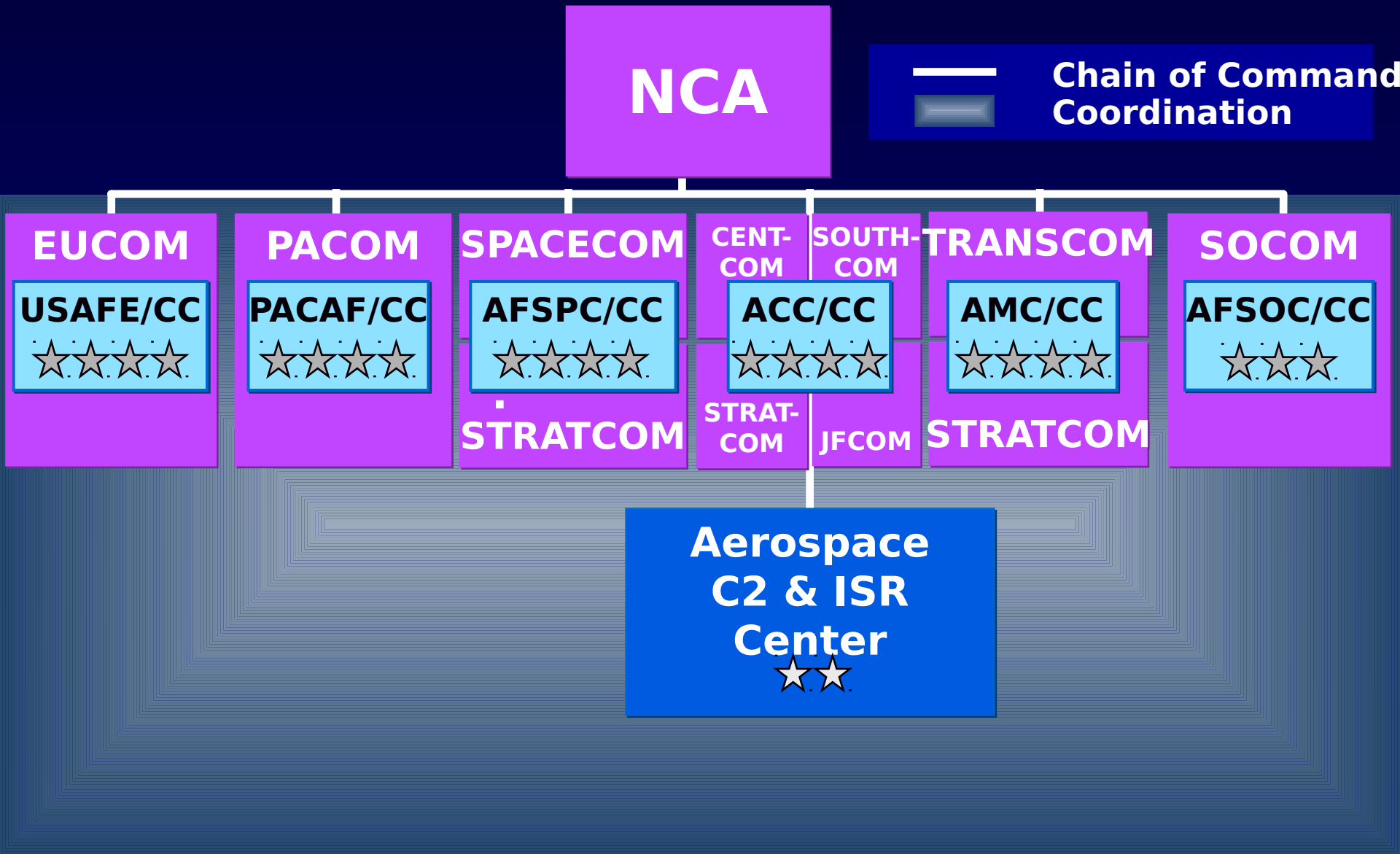
Lead organization to integrate and influence Air Force Command and Control & Intelligence, Surveillance, and Reconnaissance Primary tasks:

- **Modernization planning**
- **C2 & ISR operational requirements**
- **Resource prioritization**
- **Configuration control**
- **AF experimentation**

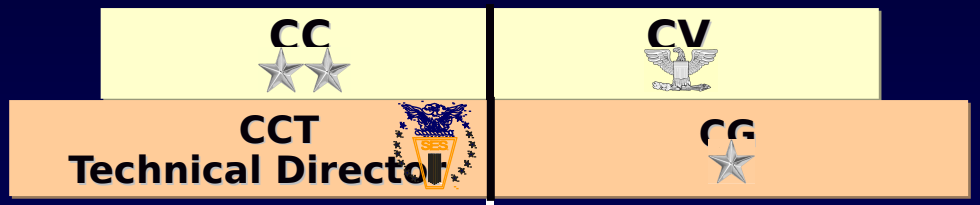
AC2ISRC Charter signed by CSAF - 4 Dec 98

Ensure Air Force C2 & ISR Meets the Challenges of Global Engagement, Joint Vision 2010 and Beyond

Joint Relationships



AC2ISRC Organization



A-2 Intelligence

A-3 C2 Operations

A-4 Agile Combat Support

A-5 Plans & Programs

A-6 Communications Information Grid

A-7 Decision Superiority

A-8 Sensors & Platforms

C2M Mobility

C2S Special Ops

C2N Strategic Forces

C2U UAV

CCR AFRC

CCG ANG

AFC2TIG AF C2 Training & Innovation Group

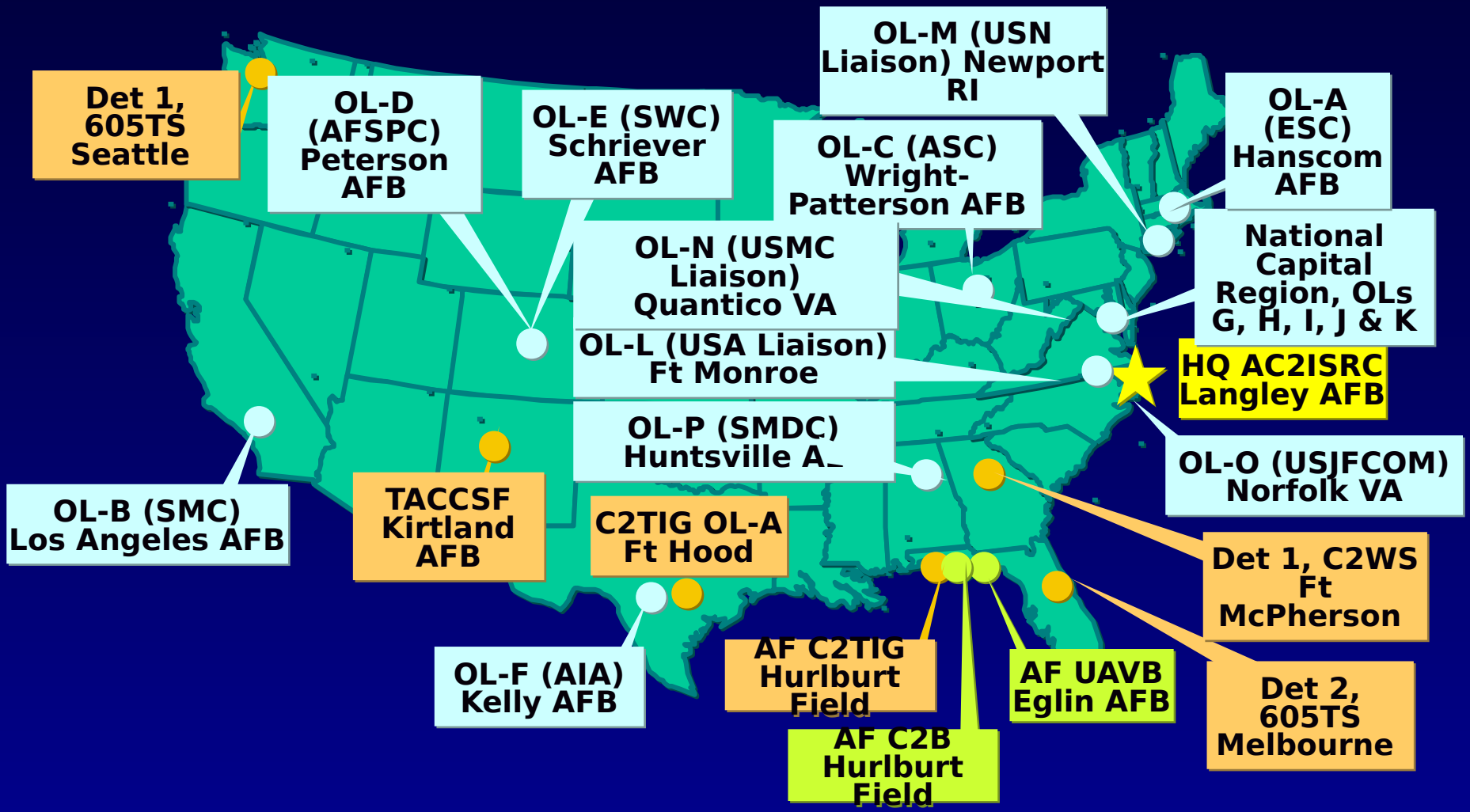
C2B C2 Battlelab

AFEO AF Experimentation Office

UAVB UAV Battlelab

JWID Joint Project Office

AC2ISRC Locations



Top-Five Needed Critical Capabilities

- Collaborative C2 Centers that operate with standard rules in an assured data environment
- COP that collects and displays decision-quality data like an operational radar
- Accurately Find, Fix, Track Time Critical Targets
- Dynamic effects-based targeting, weapon pairing and control
- Automated and timely effects-based assessment

Overview

- Mission and Organization
- **Priorities**
- Challenges

AC2ISRC/CC Top Five Personal Priorities

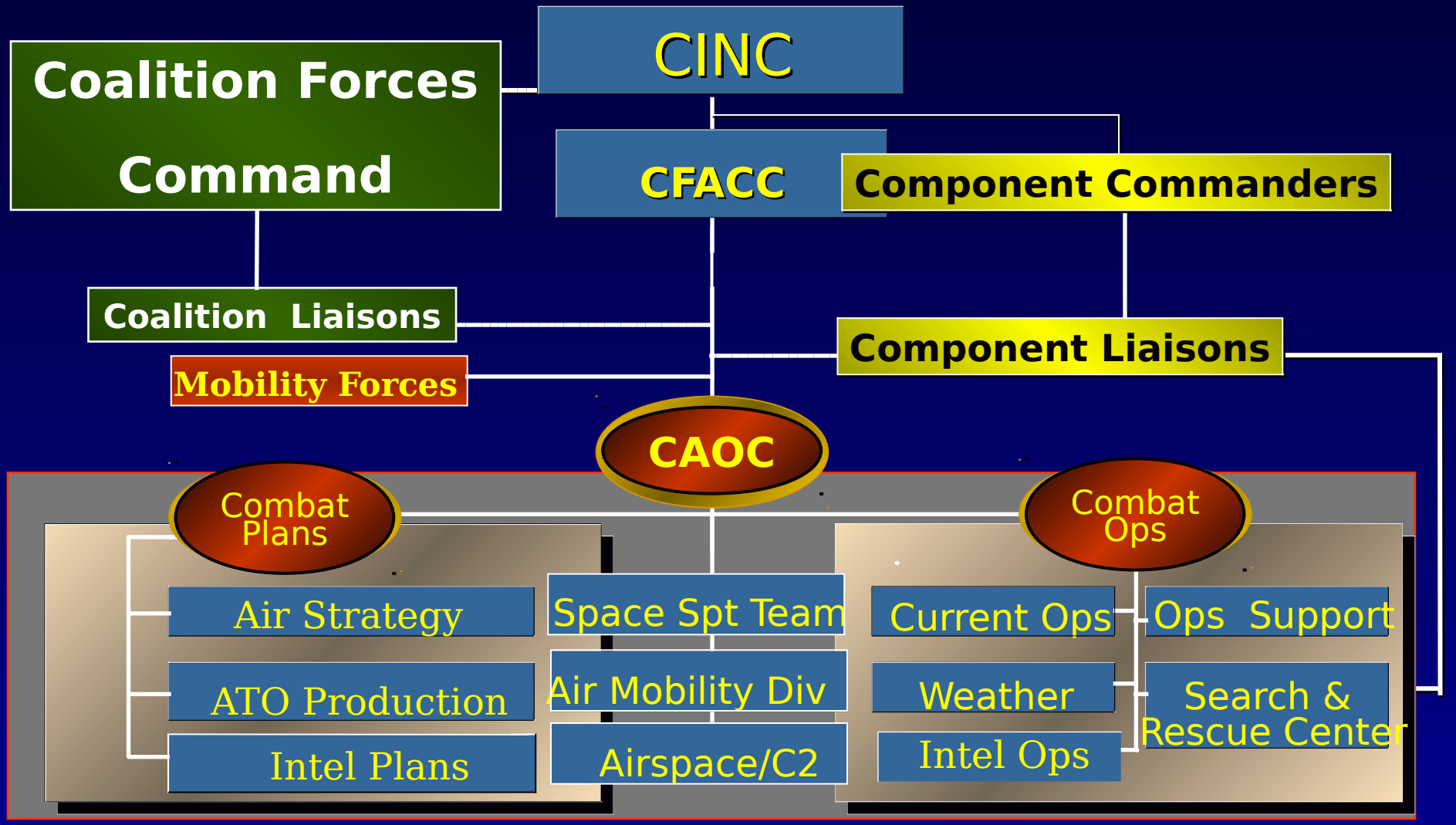
(as of Sep 00 – Revised Biannually)

- Create and use CAOC-X
  - Web enable all C2 applications within GCCS-AF structure
  - Create JTF-SWA CAOC
  - Embrace many partners
- Create TCT capability by collaborating jointly and using Nellis CAOC
- Define AF C2ISR “To Be” CONOPS and Ops Architecture
- Build joint CONOPS and way ahead for the operationalized

Combined Aerospace Operations Center (CAOC)

. . . to **integrate** limited assets in support of the JFC's objectives.

CAOC Organization



Air Tasking Order Cycle Model

Recommendations

Combined Force Commander / Component Coordination

Guidance

Combat Assessment

Target Development

Results

Target List

Force Execution

Weaponeering/ Allocation

Air Tasking Order / Special Instructions

Combined ATO Development

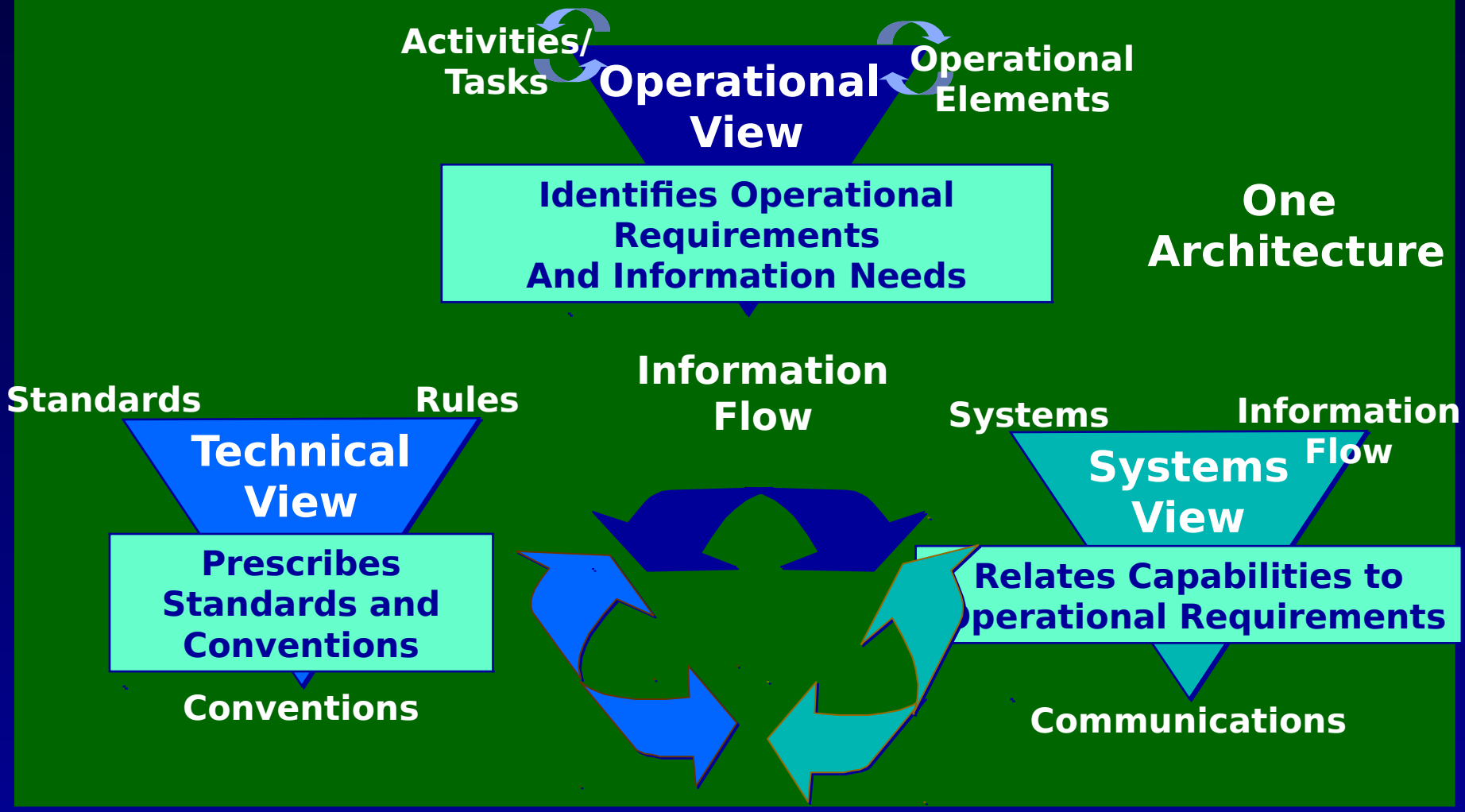
Master Air Attack Plan

CAOC-X Mission Statement

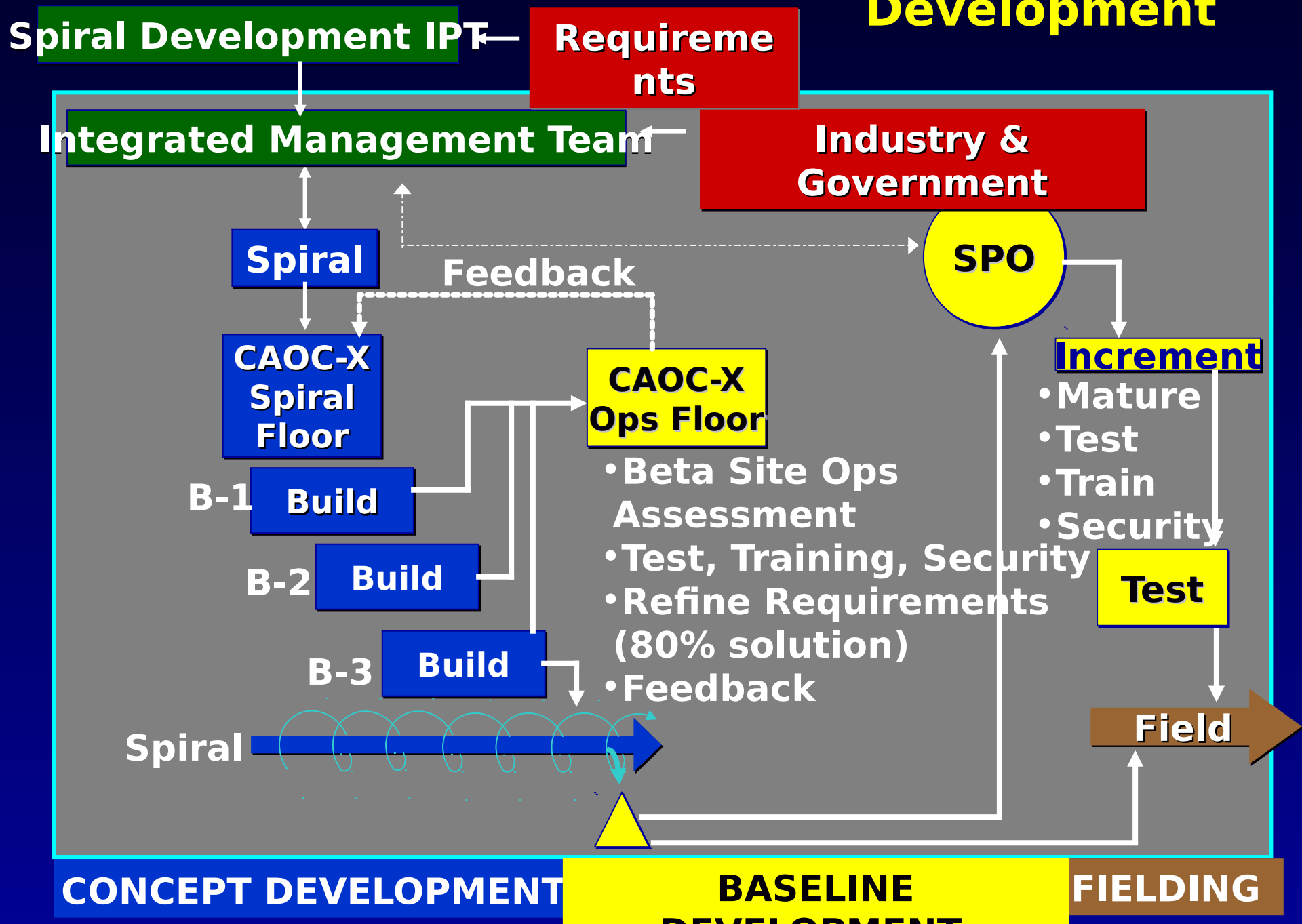
A place and process to rapidly develop and field the AOC Weapon System

Development Process Foundation (AFI 33-124)

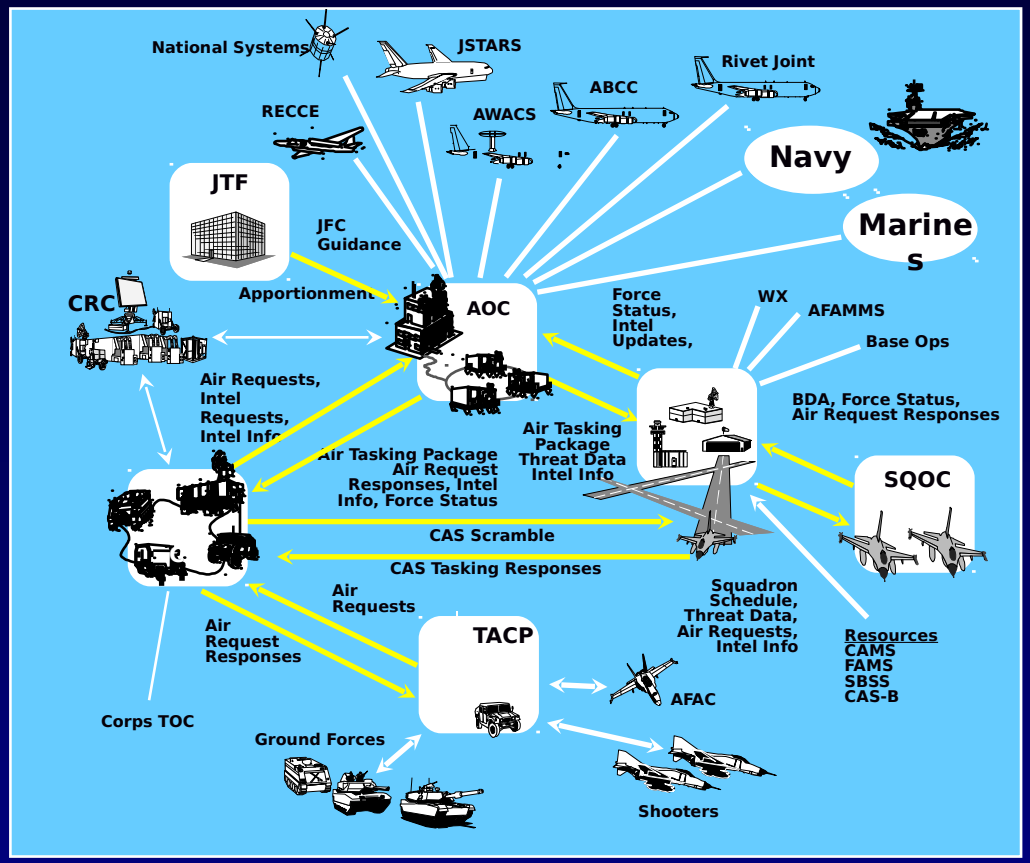
CONOPS



Spiral Development



What is TBMCS?



Links Planning, Intelligence, and Operations Functions

Integrates the Unique Capabilities of Several Legacy Systems

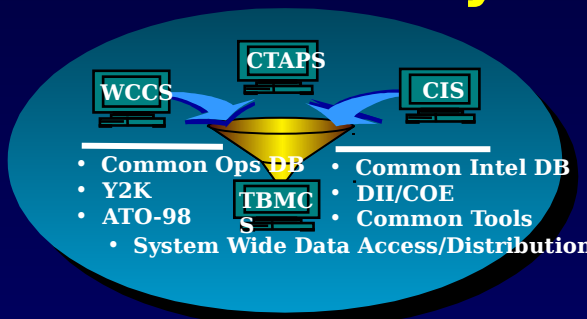
Migrates Air Warfare Applications to DII COE, the Single C4I System to Support the Warfighter from Foxhole to Command Post

Evolves with New Technology to Enhance Employment of Air Power

A Battle Management System for Planning and Executing the Theater Air War

TBMCS Capabilities

Integrated Functionality



Consolidates 3 legacy system into one integrated capability between force and unit

Enhanced Interoperability

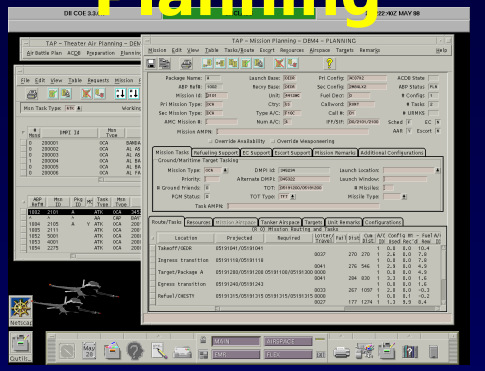
Joint & Allied Interoperability - USMTF 98

Automated coordination on targeting, planning, and execution

Automated Army Air Support Requests

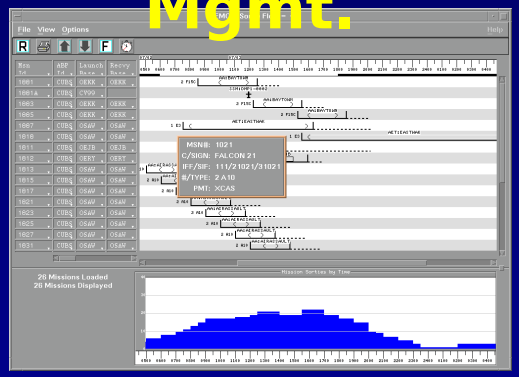
Real Time Air Lift Interface

Robust Planning



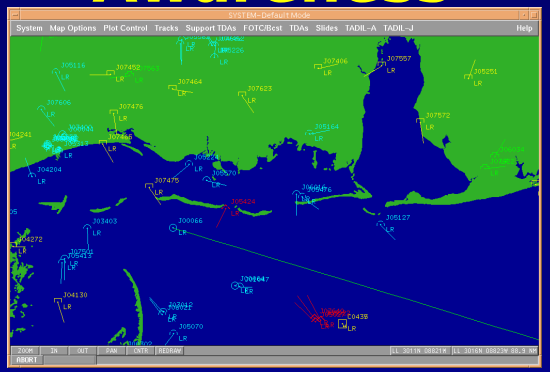
***ABP - 3 times more comprehensive,* 1/3 Less operators, 25% less development time**

Superior Execution Mgmt.



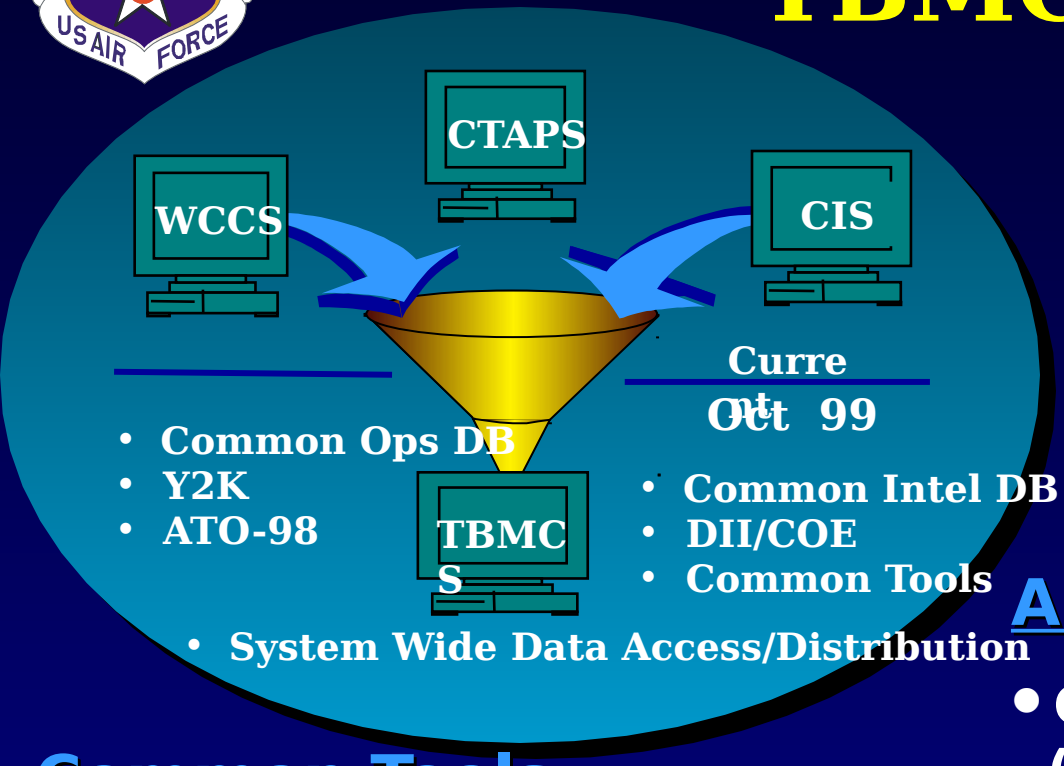
NRT Sortie flow View
Shared insight into Component Operations

Shared Enemy Awareness



NRT Enemy Order of Battle Updates *Shared Common Operational Picture*

TBMCS



Combat Plans

- JFACC Planning Tool (JPT)
- Joint Defensive Planner (JDP)
- Theater Air Planner (TAP)

Combat Operations

- Execution Management (EM)
- Time Critical Targets(TCT)

Air Support Ops Center

- Close Air Support Tool (CAST)

Common Tools

- Airspace Deconfliction (AD)
- Targeting & Weaponeering (TW)
- Situation Awareness & Assessment
- ATO/ACO Tool (AAT)
- I3 (Integrated Intelligence & Imagery)
- Weather

Unit Level Applications

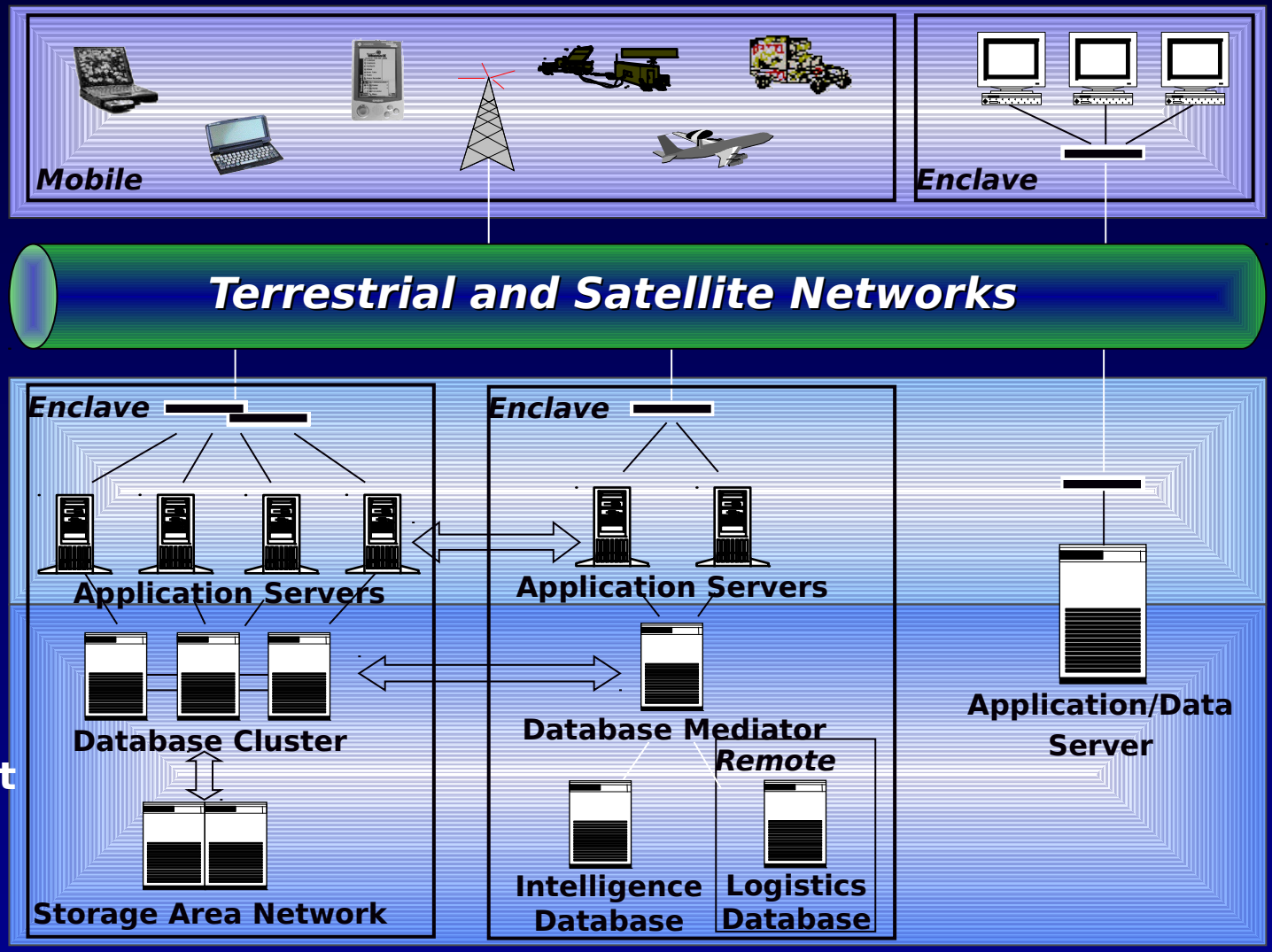
- Flying Operations (FLYOPS)
- Air Base Operations (ABOPS)
- Wing Support (WS)

TBMCS Web Enable Goal

Provide a secure, platform-independent, single point of
login, browser-based point of access to the right inform
at the right time, and in the required format, from any
based on individual roles, interests, and use.

Reduced hardware footprint and ease the sysad burden to the greatest extent possible

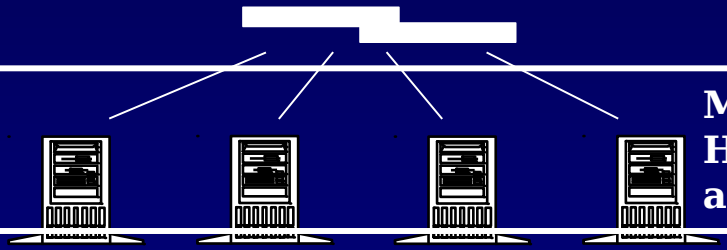
Objective Web Enabled Architecture



AOC Objective System Architecture

Thin Client

100MB LAN



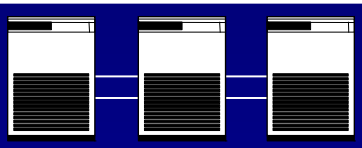
COE

Msg Processing, Offic Auto, O
Help, Web services, Comms, D
access, Apps, Data mgmt, ...

Operating System

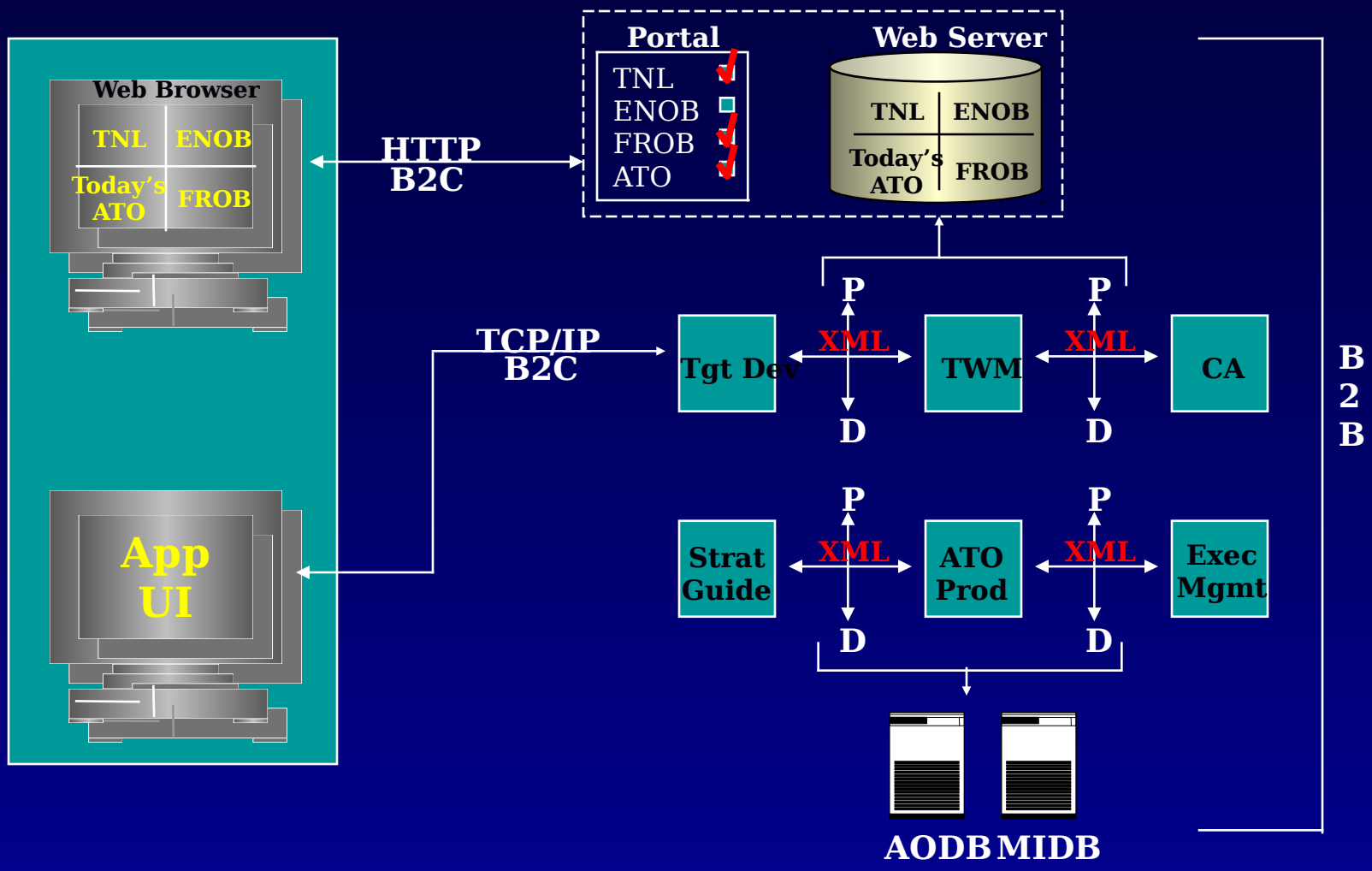
Security, network and print
services, system mgmt

Database



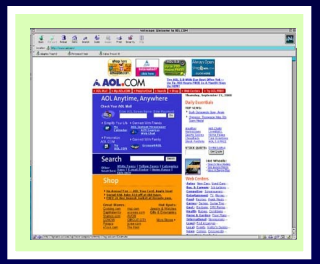
Database Cluster

Detailed TBMCS-Force Level Architecture



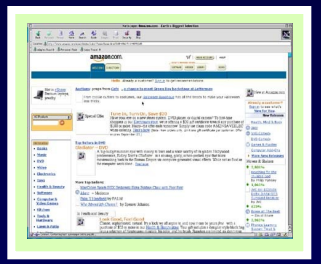
Commercial Evolution of Web Access

- **Internet**
  - Browsing
  - Personalized views
  - On-line transactions



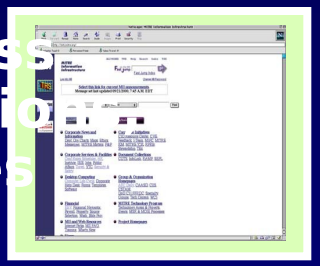
aol.com

yahoo.com



amazon.com

- **Horizontal Enterprise Access**
  - Broad range of application information and services



MII

W3.ibm.com

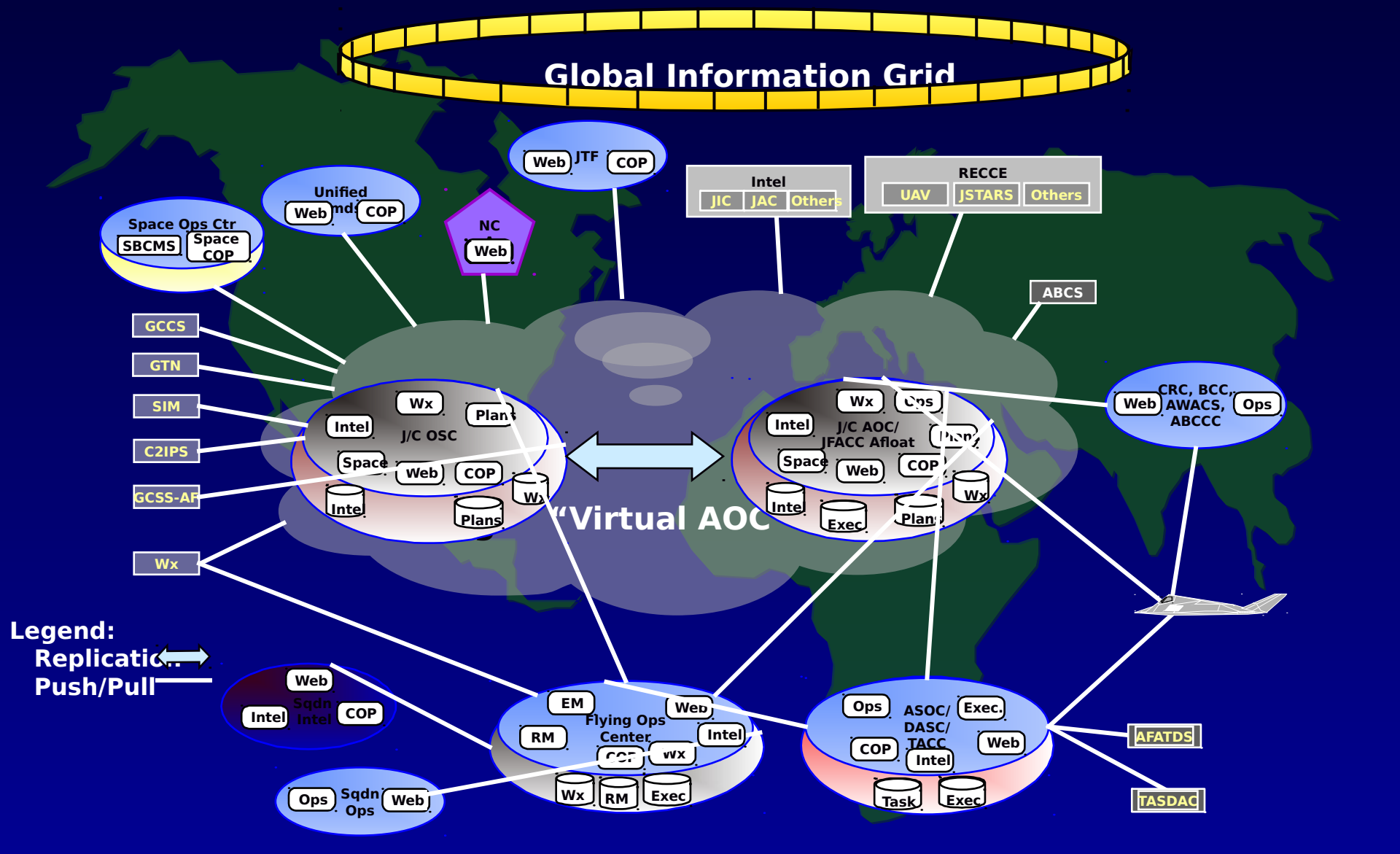
AFMC

- **Vertical Enterprise Access**
  - Focused applications, information and services for specific functional areas

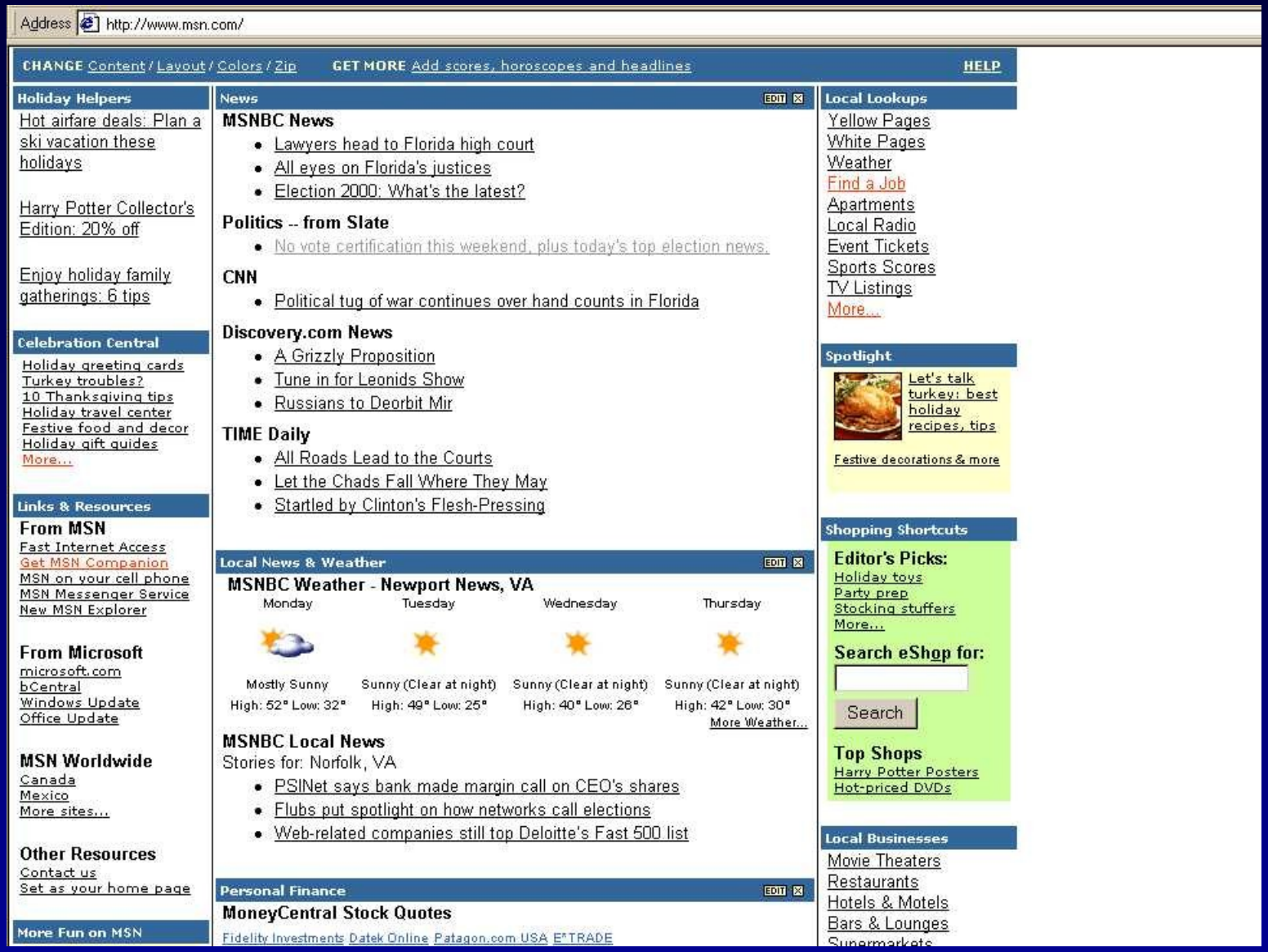
AFC Daily

CORONA Portal

Objective System Architecture



My.AOL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Harry Potter Collector's Edition: 20% off
Enjoy holiday family gatherings: 6 tips
Celebration Central
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10 Thanksgiving tips
Holiday travel center
Festive food and decor
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More...
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From MSN
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MSN Messenger Service
New MSN Explorer
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Lawyers head to Florida high court
All eyes on Florida's justices
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Political tug of war continues over hand counts in Florida
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Russians to Deorbit Mir
TIME Daily
All Roads Lead to the Courts
Let the Chads Fall Where They May
Startled by Clinton's Flesh-Pressing
Local News & Weather
MSNBC Weather - Newport News, VA
Monday
Tuesday
Wednesday
Thursday
Mostly Sunny
High: 52° Low: 32°
Sunny (Clear at night)
High: 49° Low: 25°
Sunny (Clear at night)
High: 40° Low: 26°
Sunny (Clear at night)
High: 42° Low: 30°
More Weather...
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Stories for: Norfolk, VA
PSINet says bank made margin call on CEO's shares
Flubs put spotlight on how networks call elections
Web-related companies still top Deloitte's Fast 500 list
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Fidelity Investments Datek Online Patagon.com USA E*TRADE
Local Lookups
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Apartments
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TV Listings
More...
Spotlight
Let's talk turkey: best holiday recipes, tips
Festive decorations & more
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Editor's Picks:
Holiday toys
Party prep
Stocking stuffers
More...
Search eShop for:
Search
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Harry Potter Posters
Hot-priced DVDs
Local Businesses
Movie Theaters
Restaurants
Hotels & Motels
Bars & Lounges
Supermarkets

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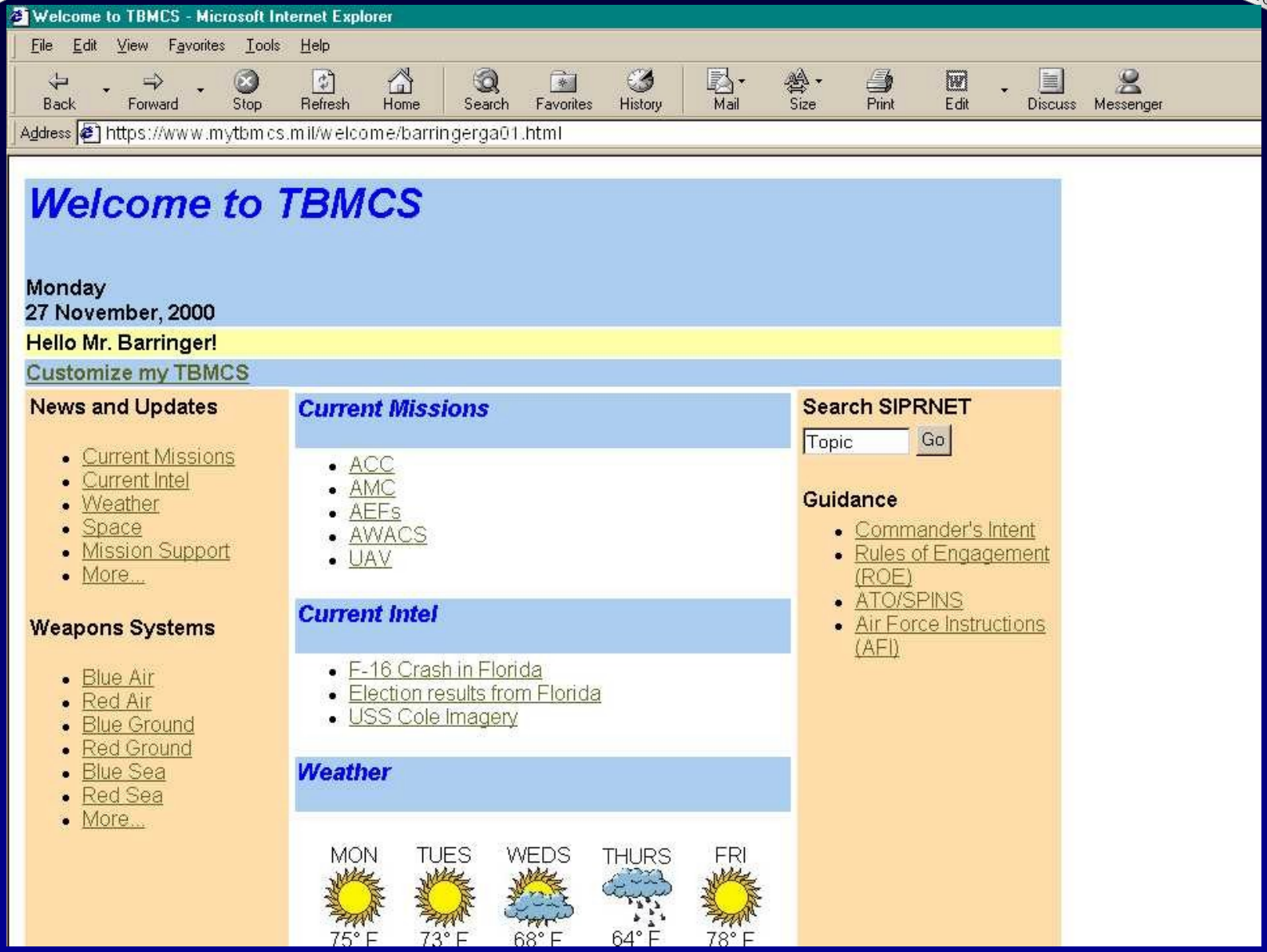
Welcome to TBMCS - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Size Print Edit Discuss Messenger
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Monday
27 November, 2000
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Current Missions
Current Intel
Weather
Space
Mission Support
More...
Weapons Systems
Blue Air
Red Air
Blue Ground
Red Ground
Blue Sea
Red Sea
More...
Current Missions
ACC
AMC
AEFs
AWACS
UAV
Current Intel
F-16 Crash in Florida
Election results from Florida
USS Cole Imagery
Weather
MON TUES WEDS THURS FRI
75° F 73° F 68° F 64° F 78° F
Search SIPRNET
Topic
Go
Guidance
Commander's Intent
Rules of Engagement (ROE)
ATO/SPINS
Air Force Instructions (AFI)

Air Force Portal

AC2ISRC/CC Top Five Personal Priorities

(as of Sep 00 – Revised Biannually)

- Create and use CAOC-X
  - Web enable all C2 applications within GCCS-AF structure
  - Create JTF-SWA CAOC
  - Embrace many partners
- Create TCT capability by collaborating jointly and using Nellis CAOC
- Define AF C2ISR “To Be” CONOPS and Ops Architecture
- Build joint CONOPS and way ahead for the operationalized

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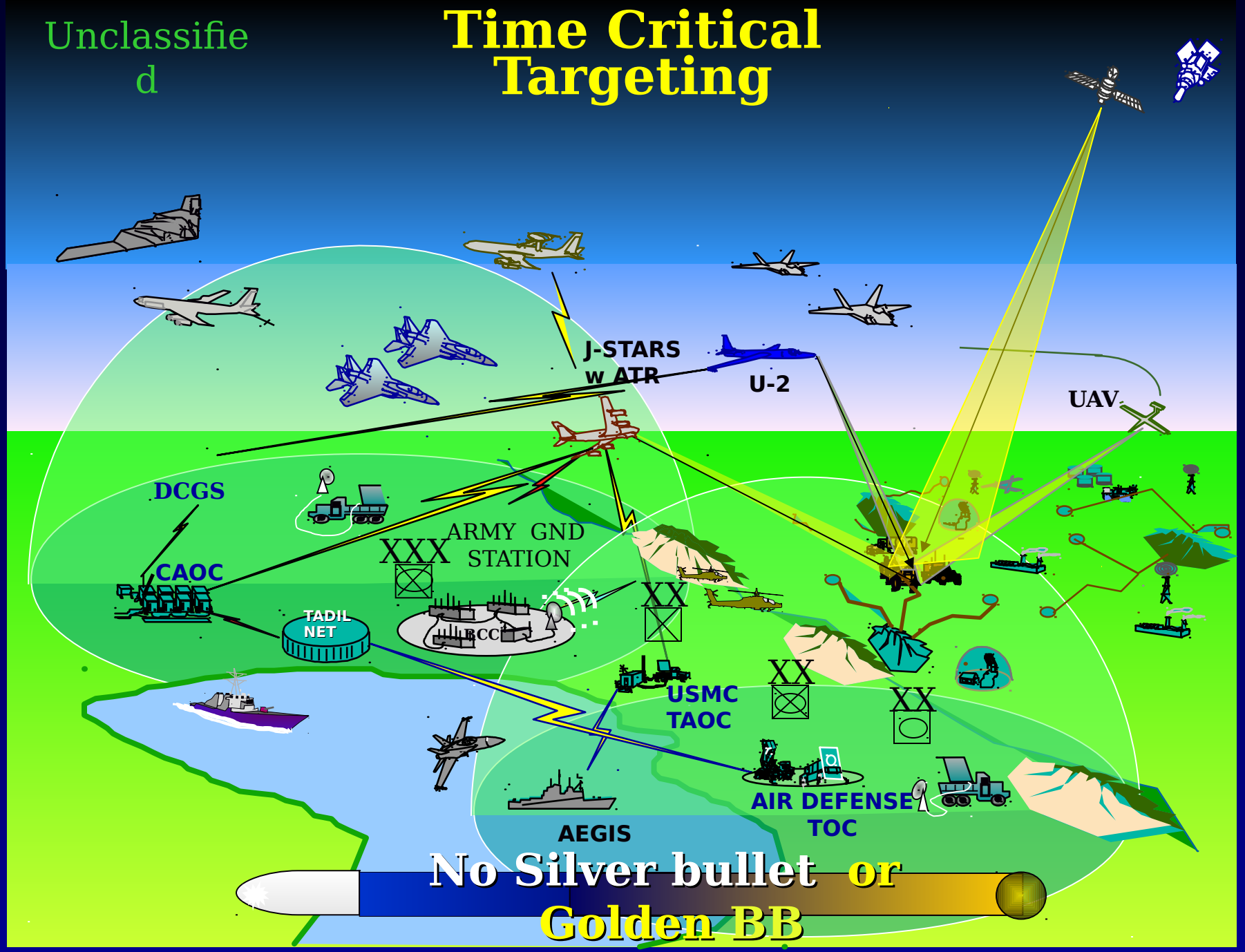
Time Critical Targeting



No Silver bullet or Golden BB

Unclassified

TCT Capability
Situational Awareness & Target Development Tools

ISR BatMan Tool

- Coverage
- V
- -ors
- -
- IP
- g
- -
- -SPINS / ROE

FIND FIX TRACK TARGET ASSESS

Target Weapon Pairing

W e Tgt Pairing

May Recommend ISR Retasking

ENGAGE

Joi Exe

Inter Service

JOINT ENGAGE

TCT Aid

Maps

Ta

-A n An

-IP

W Su

ISR Asset Coverage

ROE / Restrictions / SPINS

Sensor

FIND FIX TRACK TARGET

Situation Display

Air & Ground Tr

Airspace Deconfliction

Air Defense

TRACK

Intel Prep of Battlespace (PBA)

Op Areas for: Attack Ops, Passive / Active Defense

TCT Activity Areas

Named Areas of Interest

E Targets

Decision Points

Threats / Prob. Tgt List

Situation Templates

Ta Te Procedures Template

FIND

FIND

Nellis CAOC

- Improve TCT TTPs
- Merge operational and tactical levels
- Address Kosovo, ONW, OSW, and Desert Storm lessons
- Improve flexible attack ops

Training Audience

- **Three Primary Audiences:**

– **Tactical Aircrews taking part in Red Flag, Weapons School & Air Warrior**

– **CAOC Operators assigned as core cad to a CAOC Operations Squadron**

– **AF Senior Leaders performing CAOC Dir and Combat Ops Director duties**

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- Define AF C2ISR "To Be" CONOPS and Ops Architecture

- Build joint CONOPS and way ahead for the operationalized

OV-1 AF Theater C2&ISR System

Time: 2000-2004
Scenario: MTW

Core Competencies
- TACS
- AETACS
- GTACS
- ISR

AF C2ISR "To Be" CONOPS & Ops Architecture

Reachback Support

- National Nodes
- Multi-national Nodes
- Joint Nodes
- AF Global Nodes (DCGS etc.)
- Nodes From Other Theaters

Support Requests

Notional

Time: 2005-2013
Scenario: MTW

CONOPS Efforts

- AF C2&ISR CONOPS
  - "As-Is" in MAJCOM two-digit coordination
  - "To-Be" in draft, MAJCOM conference Nov 00
- Theater Air Control System CONOPS
  - Final draft due 29 Nov 00
- AF AOC CONOPS
  - Out for MAJCOM / CC coordination
- AFFOR CONOPS
  - Out for MAJCOM 2-Ltr coordination
- CAF CONOPS for Integration of C2&ISR
  - In MAJCOM two-digit coordination
- CAF CONOPS for C2 Against Time Critical Targets
  - Approved 97
  - To be updated 1st Qtr CY01
- GCCS-AF CONOPS
  - Completed MAJCOM 3-Ltr Coord
  - Sending for 2-Ltr Coord 4th Qtr CY00

AC2ISRC/CC Top Five Personal Priorities

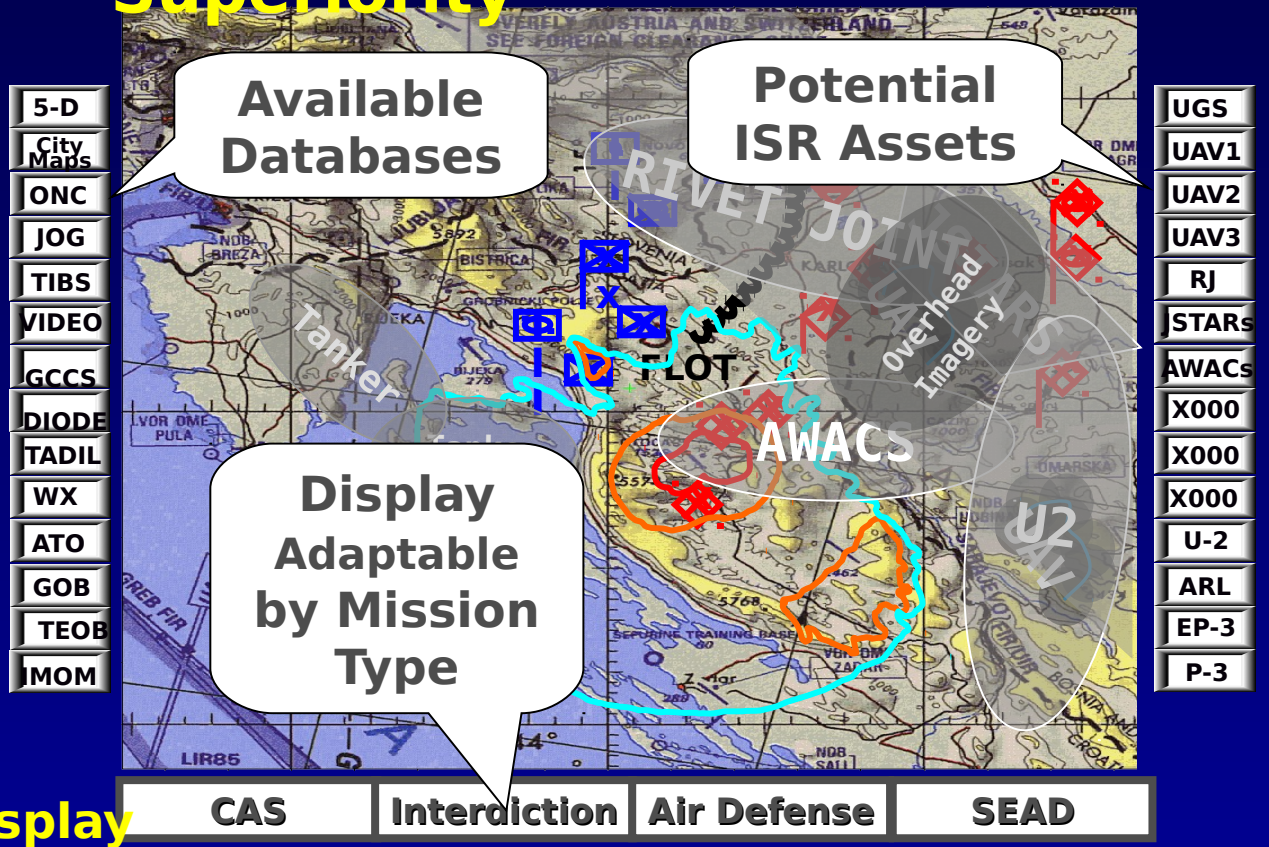
(as of Sep 00 – Revised Biannually)

- Create and use CAOC-X
  - Web enable all C2 applications within GCCS-AF structure
  - Create JTF-SWA CAOC
  - Embrace many partners
- Create TCT capability by collaborating jointly and using Nellis CAOC
- Define AF C2ISR “To Be” CONOPS and Ops Architecture
- Build joint CONOPS and way ahead for the operationalized

Family of Interoperable Operational Pictures (FIOP)

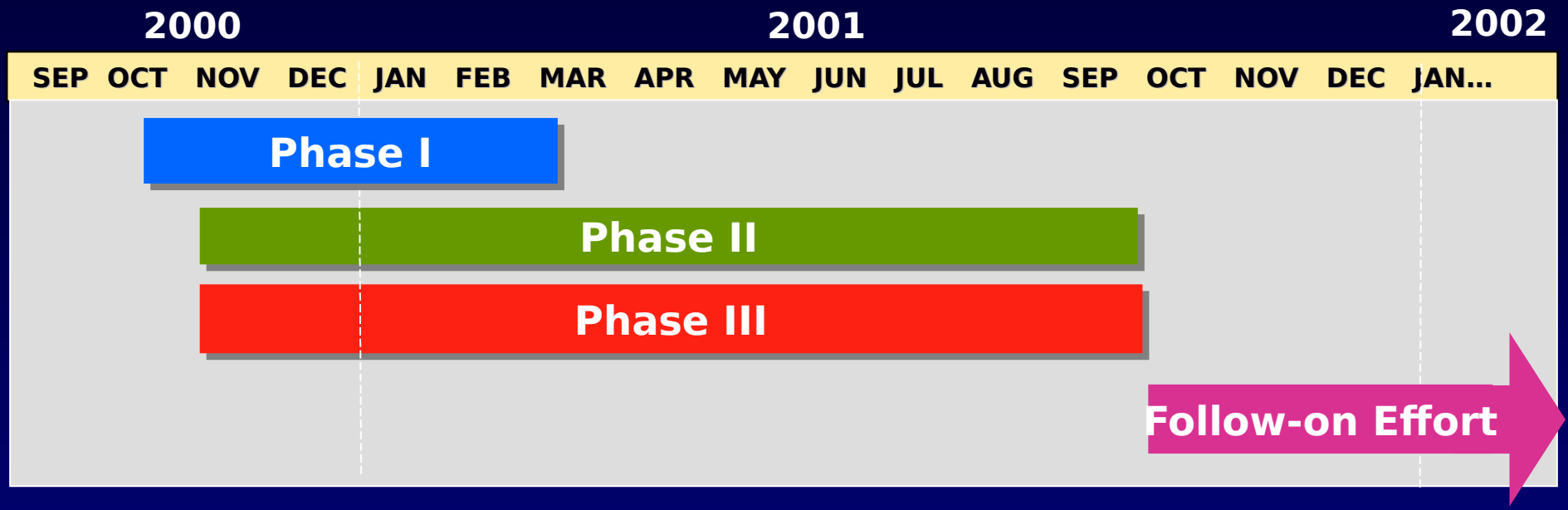
Unambiguous, Tailorable View of the Battlespace with Actionable, Decision-Quality Information to Achieve Decision Superiority

- **Phase 1:** CONOPS
- **Phase 2:** Requirements Definition
- **Phase 3:** Implementation Strategy



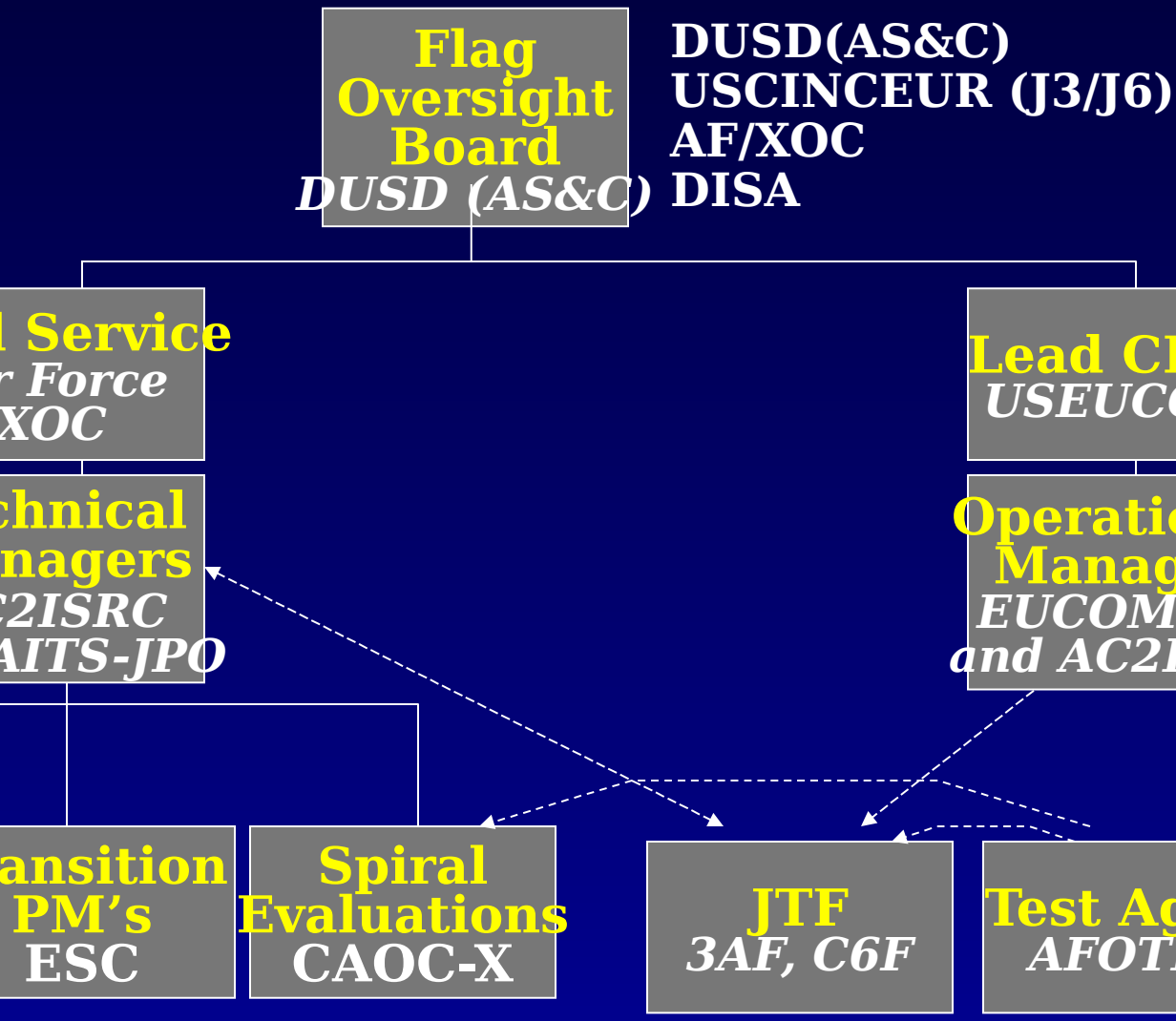
Notional Display

FIOP Plan



- Phase I (AF Led) Oct 00 – Feb 01 (5 Months): Develop Joint CONOPS
- Phase II (Army Led) Nov 00 – Sep 01 (11 Months): Define requirements
- Phase III (Marine Led) Nov 00 – an Sep 01 (11 Months): Develop Implementation Strategy
- Follow-on Effort: Oct 01 – TBD: Execute implement strategy

Advanced Battlespace Awareness ACTD



ABA Architecture

COP

TCT

ISR

BM

DYNAMIC DATABASE

COP

ENHANCED IPB

EFFECTS BASED OPERATION

JTT

AODB

MIDB

IPL

JTT

eXternal Database Interface (XDBI)

Adaptive Sensor Fusion → JBI

GMTI MASINT

FOPEN GMTI

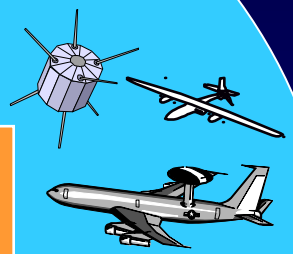
SIGINT

GMTI IMINT

Fusion Manager

FUSION FOR TCT AND TARGETS UNDER TREES

External Interface



- Intel Sources
- Air Surveillance
- Surface Surveillance
- Space Surveillance

AIR FORCE PROGRAMS

GCCS/TBMCS - DII COE

AC2ISRC/CC Top Five Personal Priorities

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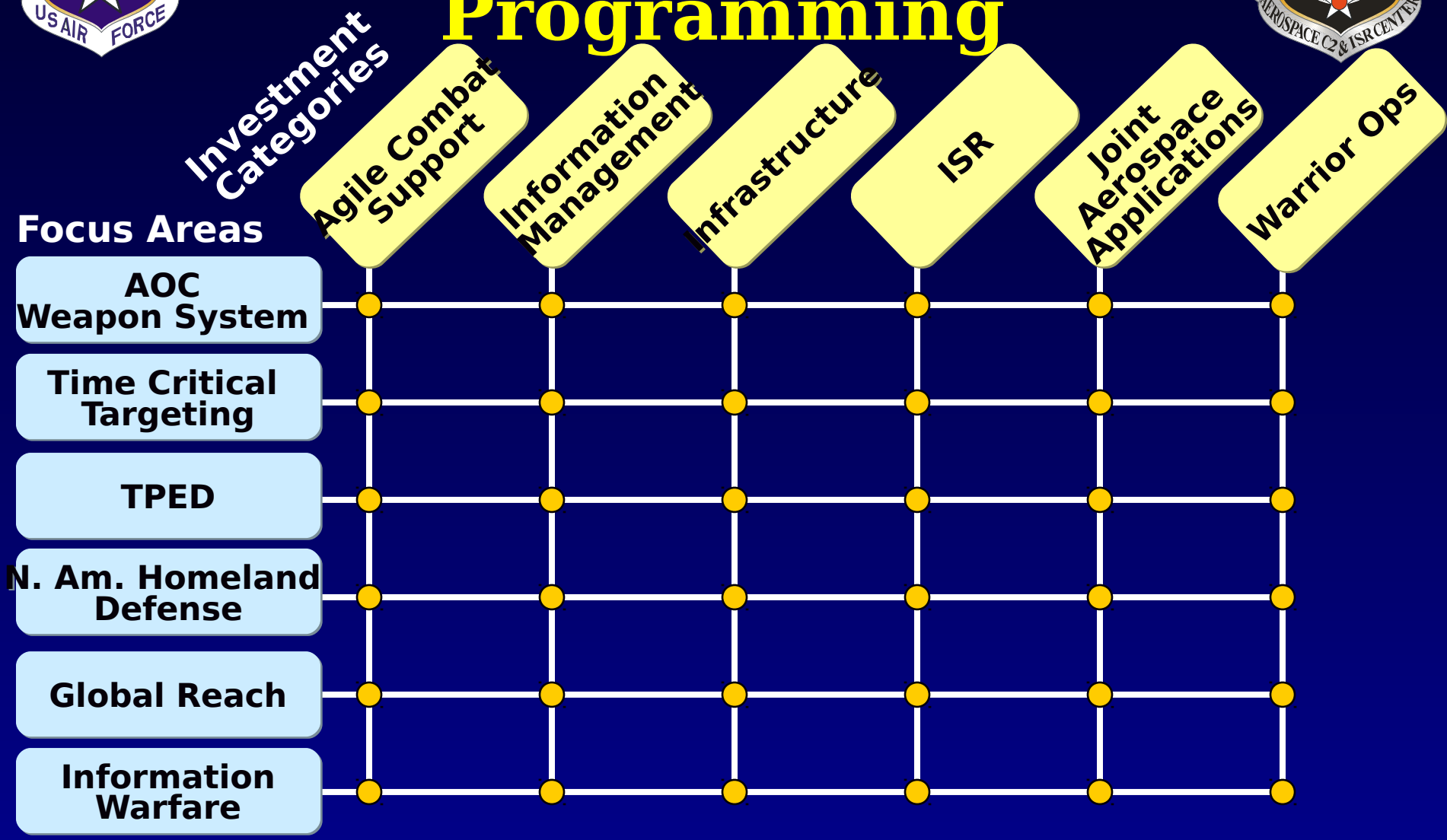
- Define AF C2ISR “To Be” CONOPS and Ops Architecture
- Build joint CONOPS and way ahead for the operationalized

Planning and Programming



Cross cutting issues: Sustainment, Divestiture, Integration,

Challenges

- Develop way ahead for web-based C2ISR
- Utilize CAOC-X to experiment
- Capitalize on commercial technology base
- Operate in a multi-level secure environment with coalition partners

Questions?

Predictive Battlespace Awareness Needed Capabilities

- Dynamic knowledge base including history
- Continuous simulation, analysis and prediction of enemy courses of action
- Integrate airborne sensors and space sensors into PBA process

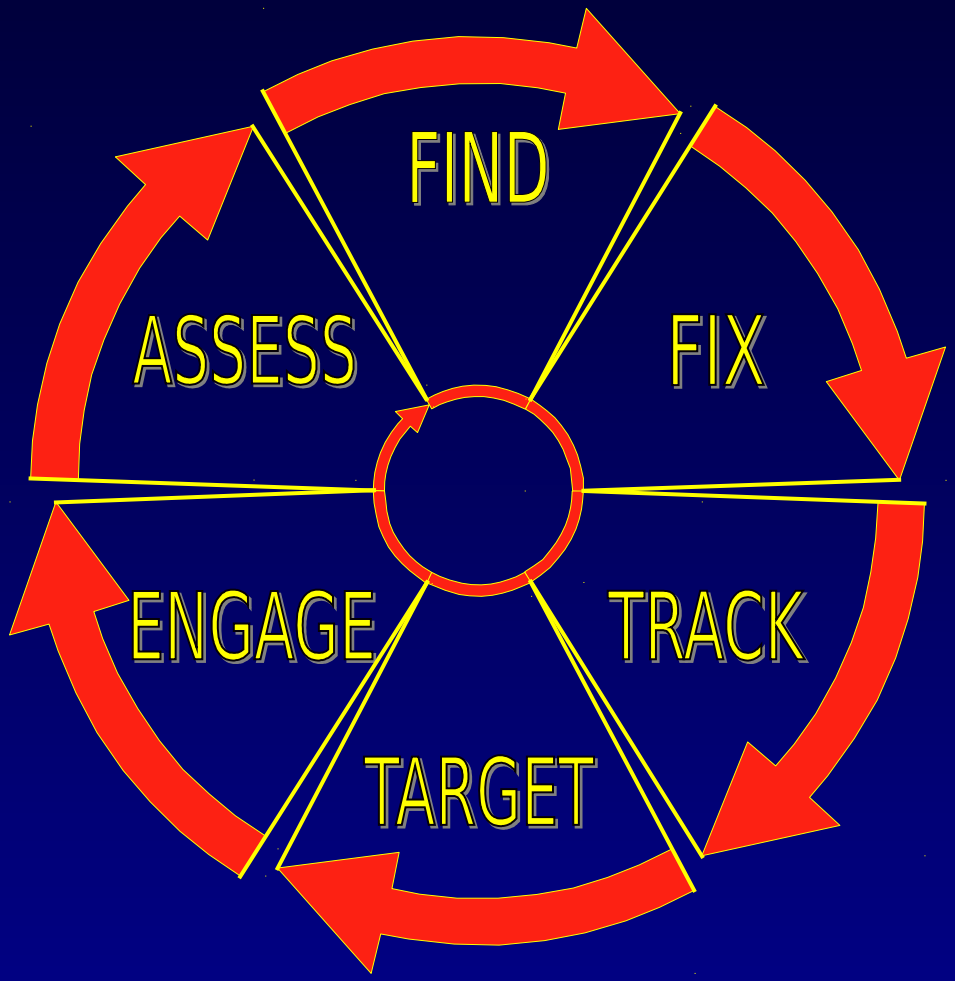
Know and Predict the Crime Scene Before the Crime

Deter / Deploy Needed Capabilities

- Automated ATO build
- En route tasking, mission planning and near real-time assessment
- Global collaboration
- Real-time planning, control and execution
- Reduced forward footprint
- Total asset visibility

Focus on Decisions, Not Data

The Kill Chain



Requires Family of Systems

CAOC-X Mission Statement

Rapidly evolve the Combined Aerospace Operations Center weapon system **by combining the efforts of warfighters, developers, contractors, and testers, working together to** ***provide the Joint/Coalition Forces Air Component Commander the decision making tools*** **to prosecute the** **ospace**

Place and processes to rapidly develop and field the AOC Weapon System

Employment Needed Capabilities

- Work in a multi-level security environment
- Real-time information into the cockpit
- Quickly establish and manage virtual planning teams
- C2 nodes and platforms retrieve, manipulate, correlate and fuse best available data
- Accurately Find, Fix, Track Time Critical Targets
- Dynamic effects-based targeting, weapon pairing and control
- Automated and timely effects-based assessment

Nellis CAOC Mission Statement

Provide a combat operations platform to perform training and testing of the equipment and concepts which constitute the Combat Operations Division of a Combined / Joint Air Operations Center (AOC)

Way Ahead

- Create capabilities through CAOC-X
- Work jointly to improve TCT capability
- Define AF C2ISR “To Be” CONOPS and ops architecture
- Build CONOPS and way ahead for the operationalized picture of the battlespace
- Provide a capabilities-based C2ISR 03 APOM submission

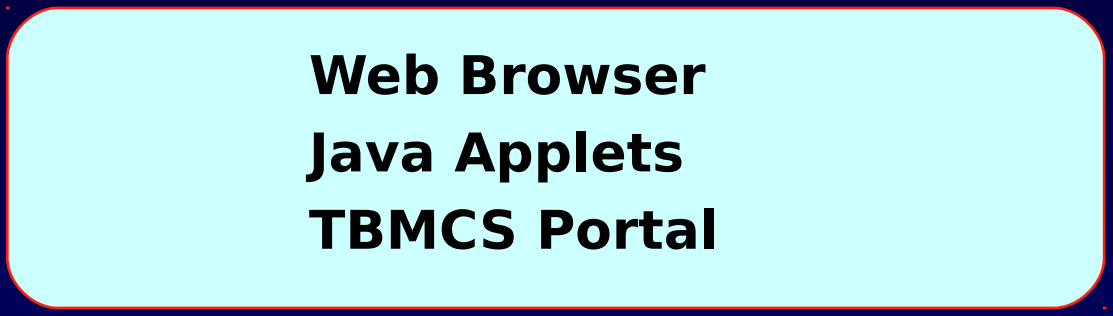
TBMCS Multi-tiered Software

Clients

Middle

Databases

Web-enabled TBMCS Architecture

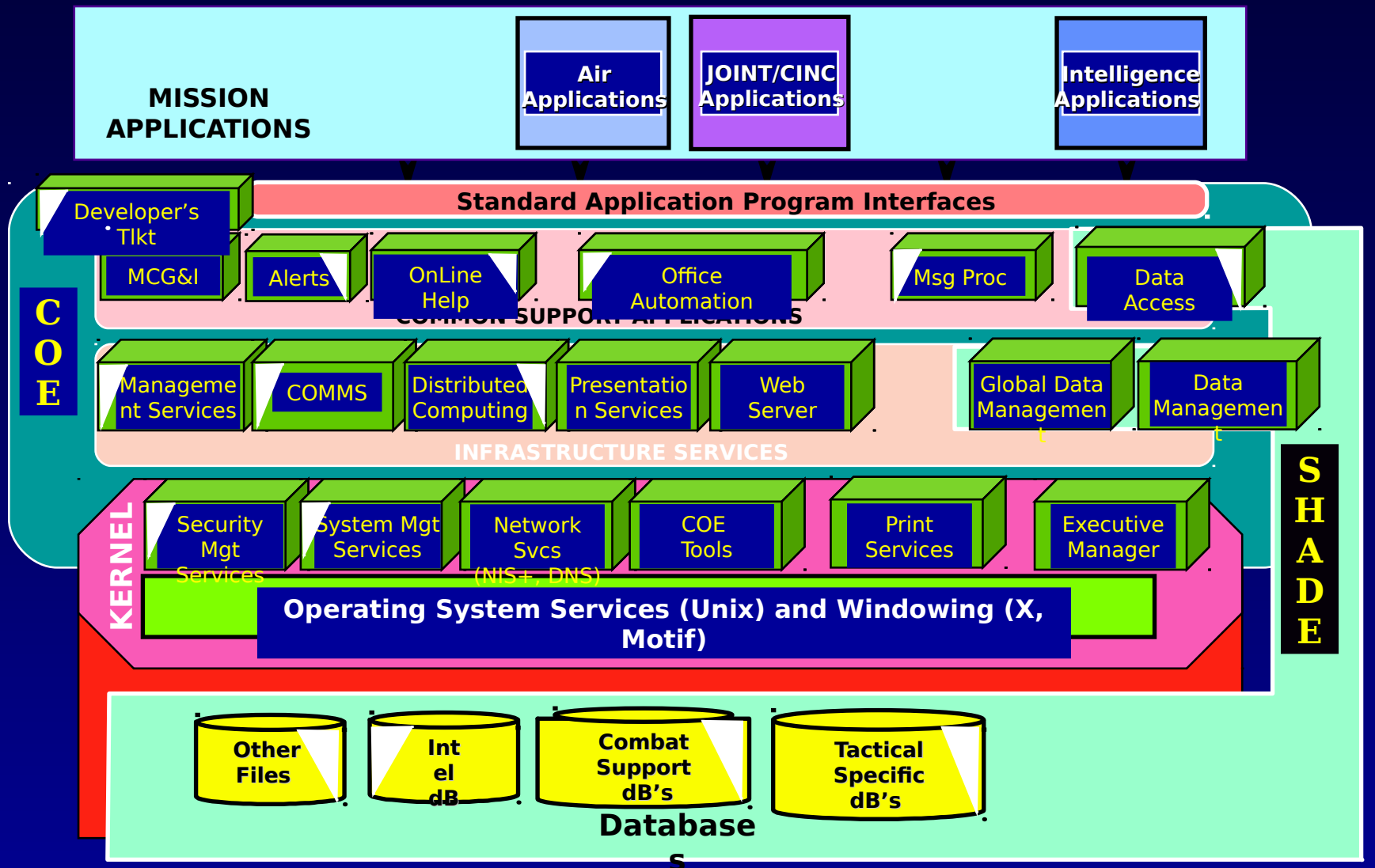


Clients

Middle

Databases

TBMCS DII COE Architecture



FIOP Organization

Chair
(Air Force)

Multi-Service C2
FOSC

AF-provided Facilitators/Integrators

Phase I
CONOPS Effort
Air Force Lead

Phase II
Requirements Effort
Army lead

Phase III
Implementation Effort
Marine lead